

HISTORICAL AND FUTURE CLIMATES FOR THE ASSESSMENT OF ENERGY SECTOR IMPACTS IN CANADA: A BRIEF

Climate impacts and adaptation research and assessments require historical climate information and scenarios of plausible climate futures. To be effective and to provide an opportunity to fully understand energy sector impacts and adaptation, the research and assessments must be able to look at impacts and adaptation options within and across sectors, regions and across the nation using consistent/comparable information. In support of this approach, the associated climate information should be developed so that it is comparable with that being used in other studies in the energy sector and related sectors. The Program on Energy Research and Development funded the project "**Historical and Future Climates for the Assessment of Energy Sector Impacts in Canada**". The project is being implemented by the Adaptation and Impacts Research Group (AIRG), Meteorological Service of Canada in collaboration of Canadian Climate Impacts Scenarios Project (CCIS), Monitoring and Data Interpretation Division, Meteorological Service of Canada, Office of Energy Research and Development, Natural Resources, Canada and National Archive and Data Management Directorate, Meteorological Service of Canada. The project has following two major objectives:

- To develop, make available, and provide guidance to impact researchers/users, a nationally-consistent set of energy sector scenarios of historical and future climate that address energy sector impacts researchers' and decision-makers' defined needs and which are consistent with other sectoral impacts information being developed within the Canadian Climate Impacts Scenarios (CCIS) Project.
- To engage representatives of the energy sector in updating the energy sector chapter of the Canada Country Study based on the available historical and future climate scenarios.

PROGRESSES

- The web-based worked "**Climate Scenarios for the Canadian Energy Sector**" was organised during 10-14 December, 2001. There were 60 stakeholders registered for the workshop, attracting impacts researchers and decision makers from government (75%), industry (12%), consultants (12%) and academia (1%).
- A **Background Paper** was prepared to facilitate discussion in the web-workshop.

- In order to facilitate analyses of historical climate data and construction of scenarios, statistical software “**STECA (Statistical Tool for Extreme Climate Analysis)**” has been developed.
- A **Synthesis Report** has been prepared based on the discussions held during the Web-workshop.
- Analyses of historical climate have been conducted and are now available on the CCI S website.

STECA[©] For Extreme Climate Analysis

Under the Historical and Future Climates for the Canadian Energy Sector Project, Adaptation and Impacts Research Group (AIRG), Meteorological Services of Canada has developed **STECA** (*Statistical Tool for Extreme Climate Analysis*). **STECA** is a tool for the estimation of extreme values based on measured or simulated time series data. The tool comprises a comprehensive suite of routines for performing extreme value analysis. The main features of the software are:

- **A preprocessing facility for extraction of extreme value series**
- **A large number of probability distributions:**
 - Normal
 - Gumbel
 - Pearson Type 3
 - Weibull
 - Log-Pearson Type 3
 - Log-normal
- **Two different parameter estimation methods:**
 - Method of moments
 - Method of L-moments (probability weighted moments)
- **Validation tests:**
 - Mann-Kendall test
 - Mann-Whitney U test
 - Student's t-test
 - F-test
 - Box Plot
 - Randomness Test
 - Serial Correlation
- **Two non-parametric goodness-of-fit statistics:**
 - Kolmogorov-Smirnov

- Probability plot correlation coefficient (PPCC)
- **Climatic parameter computation routines:**
 - Degree Days
 - Heat Index
 - Wind Chill
 - Heat / Cold Wave

STECA and the User Manual can be downloaded from the following links.

- [STECA](#)
- [STECA USER MANUAL](#)